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THE CARE AND FEEDING OF CHILDREN

A CATECHISM FOR THE USE OF MOTHERS AND CHILDREN'S NURSES

BY

L. EMMETT HOLT, M. D.

PROFESSOR OF DISEASES OF CHILDREN IN THE NEW YORK POLYCLINIC
ATTENDING PHYSICIAN TO THE BABIES' HOSPITAL AND THE
NURSERY AND CHILD'S HOSPITAL, NEW YORK

SECOND EDITION, REVISED AND ENLARGED

NEW YORK
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1900

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TO

MRS. ROBERT W. CHAPIN,

THROUGH WHOSE EFFORTS THE FIRST PRACTICAL TRAINING SCHOOL

FOR CHILDREN'S NURSES IN AMERICA WAS ESTABLISHED,

THIS BOOK IS RESPECTFULLY DEDICATED

BY THE AUTHOR.

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PREFACE TO THE SECOND EDITION.

THREE years of daily use of the catechism as a manual for nursery maids have shown the need of a fuller treatment of several subjects, notably infant feeding, than was given in the first edition. The same want has also been felt and expressed by mothers and nurses outside of institutions who have made the book a nursery guide.

The chapter upon feeding has therefore been entirely rewritten and much new matter introduced, especially that relating to the preparation and use of cow's milk for infant feeding. Many other points referring to clothing, growth, and training, have been touched upon for the first time, so that the size of the book has been increased by over one half.

In the matters discussed it is the needs of the well child, not the sick one, which have been considered. The well child must in the great majority of cases be left to the care of the mother or nurse for whose guidance and assistance these pages are intended. For direction in matters of illness, however, no

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mother or nurse should depend upon any manual, but upon the advice of a physician.

To Miss Marianna Wheeler, Superintendent of the Babies' Hospital, whose long experience in training nurses has made her a most competent judge of their needs, I am indebted for many valuable suggestions in this revision.

It is hoped that the mothers and nurses who have found the first edition of the catechism helpful in the solution of some of their nursery problems, may gain even greater assistance from the present volume.

14 West Fifty-fifth Street, New York,
September, 1897.

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PREFACE TO THE FIRST EDITION.

When in the fall of 1889 the Practical Training School for Nursery Maids was opened in connection with the Babies' Hospital of New York, the need was soon felt for some simple manual to put into the hands of the nurses. None could be found which fulfilled the requirements of simplicity, brevity, and exactness with reference to matters of infant feeding and nursery hygiene.

A series of questions was written out by the author for the purpose of formulating for the nurses under training those things which were matters of daily observation in the practical work of the hospital. From time to time additions have been made to these, until the present size has been reached.

This catechism is now, at the request of many friends, published, with the hope that it may serve a useful purpose in other institutions where similar schools for training may be established. At the same time, it is thought that it may be of value to many mothers in the care of their own children, or a book

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which they may safely put into the hands of the ordinary (untrained) child's nurse.

In the preparation of this catechism everything has been sacrificed to clearness and simplicity. It has been deemed best to emphasize strongly the essentials, without going into many minor details which would have increased materially the size of the book without adding to its usefulness. The style of question and answer has been adopted in order to impress more strongly the facts stated.

March, 1894.

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THE CARE AND FEEDING OF CHILDREN.

I.

THE CARE OF CHILDREN.

BATHING.

At what age may a child be given a full tub bath?

Usually when ten days old; it should not be given before the cord has come off.

How should the bath be given?

It should not be given sooner than one hour after feeding. The room should be warm; if possible there should be an open fire. The head and face should first be washed and dried; then the body should be soaped and the infant placed in the tub with its body well supported by the hand of the nurse. The bath should be given quickly, and the body dried rapidly with a soft towel, but with very little rubbing.

At what temperature should the bath be given?

For the first few weeks at 100° F.; later, during early infancy, at 98° F.; after six months, at 95° F.; during the second year, from 85° to 90° F.

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Should a child be bathed whose body is covered with an eruption?

Not as a rule, unless a physician has seen the case. Harm is often done in eczema and many other skin diseases by bathing with soap and water.

EYES.

How should the eyes of a little baby be cleansed?

With a piece of soft linen and a lukewarm solution of salt or boric acid,—one fourth of an even teaspoonful to one pint of water.

If pus appears in the eyes, what should be done?

They should be cleansed every hour with a solution of boric acid (ten grains to one ounce of water). If the lids stick together, a little vaseline from a fresh bottle should be rubbed upon them at night. If the trouble is slight, this treatment will control it; if it is severe, a physician should be called immediately, as delay may result in loss of eyesight.

MOUTH.

How is an infant's mouth to be cleansed?

Always gently, lest the lining membrane should be injured; plain boiled water is generally sufficient.

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What is sprue?

It appears on the lips and inside the cheeks like little white threads or flakes. It is also called thrush. In bad cases it may cover the tongue and the whole of the inside of the mouth.

How should a mouth be cleansed when there is sprue?

It should be washed carefully after every feeding or nursing with a solution of borax or bicarbonate of soda (baking soda), and four times a day the boric-acid solution mentioned should be used.

SKIN.

How should the infant's skin be cared for to prevent chafing?

First, not too much nor too strong soaps should be used; secondly, careful rinsing of the body; thirdly, not too vigorous rubbing, either during or after the bath; fourthly, the very free use of dusting powder in all the folds of the skin,—under the arms, behind the ears, about the neck, in the groin, etc. This is of the utmost importance in very fat infants.

If the skin is very sensitive and chafing easily produced, what should be done?

No soap should be used, but bran or salt baths given instead.

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How should a bran bath be prepared?

One pint of wheat bran should be put in a bag of coarse muslin or cheese cloth, and this put in the bath water. It should then be squeezed for five minutes, until the water resembles a thin porridge.

How should a salt bath be prepared?

A teacupful of common salt or sea salt should be used to each two gallons of water.

How should the buttocks be cared for?

This is the most common place for chafing, as the parts are so frequently wet and soiled; hence the utmost pains should be taken that all napkins be removed as soon as they are wet or soiled, and the parts kept scrupulously clean.

If the parts have become chafed, what should be done?

Only bran and salt baths should be used, and in very severe cases even these may have to be omitted for a day or two. The parts may be cleaned with sweet oil and a little absorbent cotton, and the skin kept covered with a dusting powder composed of starch two parts, boric acid one part.

What is prickly heat, and how is it produced?

It consists of fine red pimples, and is caused by excessive perspiration and the irritation of flannel underclothing.

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How should it be treated?

Muslin or linen should be put next to the skin; the entire body should be sponged frequently with equal parts of vinegar and water, and plenty of the starch and boric-acid powder mentioned should be used.

CLOTHING.

What are the most essential things in the clothing of infants?

That the chest shall be covered with soft flannel, the limbs well protected but not confined, and the abdomen supported by a broad flannel band, which should be snug but not too tight. It is important that the clothing should fit the body. If it is too tight it interferes with the free movements of the chest in breathing, and by pressing upon the stomach sometimes causes the infant to vomit soon after swallowing its food. If the clothing is too loose it is soon thrown into deep folds or bunches, which cause much discomfort. No pins should be used, but, instead, all bands about the body should be basted. The petticoats should be supported by shoulder straps.

How should the infant be held during dressing and undressing?

Nothing is more awkward than to attempt to dress a young baby in a sitting posture. It should lie upon

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the nurse's lap until quite old enough to sit alone, the clothing being drawn over the child's feet, not slipped over the head.

Of what use is the band?

It protects the abdomen, but its most important use is to support the abdominal walls in very young infants, and in this way to prevent the occurrence of rupture.

How long is this band required?

The snug band, not beyond four months. In healthy infants the flannel band may at this time be replaced by a knitted band. This may be worn up to eighteen months, although it is not essential after the first year, except in the case of a very delicate child, or one prone to diarrhœa, where it is often advisable to continue it until the third year.

What changes are to be made in the clothing of infants in the summer?

Only the thinnest gauze flannel undershirts should be worn, and changes in temperature should be met by changes in the outer garments. The greatest care should be taken that children are not kept too hot in the middle of the day, while extra wraps should be used morning and evening, especially at the seashore or in the mountains.

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Should older children be allowed to go with their legs bare?

If strong and well there is no objection to this in very hot weather. In cold weather, however, it is doubtful if any children are benefited by it, particularly in a changeable climate like that of New York. Many delicate children are certainly injured by such attempts at hardening.

What sort of underclothing should be worn during cold weather?

Never the heaviest weight, even in winter. Four grades are usually sold, the next to the heaviest being thick enough for any child.

Do not little children require as heavy flannels as older people?

Not as a rule. They usually live in a warm nursery; their circulation is active; and they always perspire easily during their play. When they go out of doors, the addition of coats and leggings renders thick flannels unnecessary.

Are not many little children clothed too thinly for the ordinary house?

Very few. The almost invariable mistake made in city homes is that of excessive clothing and too warm rooms. These two things are among the most frequent reasons for their taking cold so easily.

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NAPKINS.

How should napkins be taken care of?

They should be immediately removed from the nursery when soiled or wet. Soiled napkins should be kept in a receptacle with a tight cover, and washed as soon as possible.

Should napkins which have been only wet be used a second time without washing?

It is no doubt better to use only fresh napkins, but there is no serious objection to using them twice unless there is chafing of the skin.

NURSERY.

What are the essentials in a good nursery?

It should be remembered that an average child spends here at least three fourths of its time during the first year; hence as large a room as possible should be selected—one that is well ventilated, and always one in which the sun shines at some part of the day. The nursery should have dark shades at the windows, but no extra hangings or curtains; about the baby's crib nothing but what can be washed should be allowed. The air should be kept as fresh and as pure as possible. There should be no plumbing, no drying of napkins or clothes, no cooking of food, and no gas burning at night. A small wax night-light answers every purpose.

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How should a nursery be heated?

Best by an open fire; next to this by a Franklin stove. The ordinary hot-air furnace of cities has many objections, but it is not so bad as steam heat from a radiator in the room. A gas stove is even worse than this, and should never be used, except, perhaps, for a few minutes during the morning bath.

At what temperature should a nursery be kept during the day?

Best about 68° F., measured by a thermometer hanging three feet from the floor. Never should the temperature be allowed to go above 70° F.

At what temperature during the night?

During the first two or three months, not below 65° F. After three months the temperature may go as low as 55° F. After the first year it may be 50° or even 45° F.

At what age may the window be left open at night?

Usually after the third month, except when the outside temperature is below freezing point.

How often should the nursery be aired?

At least twice a day—in the morning after the child's bath, and again in the evening before the child is put to bed for the night. This should be done thoroughly, and the child should be removed mean-

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while to another apartment. It is well to air the nursery whenever the child is out of the room.

What symptoms are seen in a child who is kept in too hot a room?

It becomes pale, loses appetite, shows symptoms of indigestion, occasionally vomits, stops gaining in weight, perspires very much, and takes cold easily because of this and also because of the great difference between the indoor and outdoor temperatures. Its condition may be such as to lead one to suspect very serious illness.

AIRING.

At what age may a child go out of doors in the fall and spring?

Usually at one month. In the summer it may go out when one week old.

When in winter?

Airing in the room may be begun when the child is one month old. At three months it may go out on pleasant days, being kept in the sun and out of the wind.

What are the best hours for airing out of doors?

In summer and early autumn a child may be out almost any time between seven in the morning and sunset; in winter and early spring, a young child only between 10 or 11 A. M. and 3 P. M., although this depends somewhat upon the climate. In New York

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and along the Atlantic coast the early mornings are apt to be damp and the afternoons raw and cloudy.

On what kind of days should a baby not go out?

In sharp winds, when the ground is covered with melting snow, and when it is extremely cold. A child under four months old should not usually go out if the thermometer is below freezing point; nor one under eight months old if it is below 20° F.

What are the most important things to be attended to when the child is out in its carriage?

To see that the wind never blows in its face, that its feet are properly covered and warm, and that the sun is never allowed to shine directly into its eyes when the child is either asleep or awake.

Of what advantage to the child is going out?

Fresh air is required to renew and purify the blood, and this is just as necessary for health and growth as proper food.

What are the effects produced in infants by fresh air?

The appetite is improved, the digestion is better, the cheeks become red, and all signs of health are seen.

Is there any advantage in having a child take its airing during the first five or six months in the nurse's arms?

None whatever. A child can be made much more comfortable in a baby carriage, and can be equally

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well protected against exposure by blankets and the carriage umbrella.

What are the objections to an infant's sleeping out of doors?

There are no real objections. It is not true that infants take cold more easily when asleep than awake, while it is almost invariably the case that those who sleep out of doors are stronger children and less prone to take cold than others.

What can be done for children who take cold upon the slightest provocation?

They should be kept in cool rooms, especially when asleep. They should not wear such heavy clothing that they are in a perspiration a good deal of the time. Every morning the body, particularly the chest and spine, should be sponged with cold water (50° to 60° F.).

How should this cold sponge bath be given?

The child should stand in a tub containing a little warm water, and a large bath sponge filled with cold water should be squeezed two to three times over the body. This should be followed by a vigorous rubbing with a towel until the skin is quite red. This may be used at three years, and often at two years. For infants a little higher temperature (65° to 70°) may be used.

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WEIGHT, GROWTH, AND DEVELOPMENT.

Of what importance is the weight of the child?

Nothing else tells so accurately how well it is thriving.

How frequently should a child be weighed?

Every week during the first six months, and at least once in two weeks during the last six months of the first year. During the second year a child should be weighed at least once a month; after this period a child should be weighed regularly whenever there are any signs of ill health present.

How much should a child gain in weight during the first six months?

There is usually a loss during the first week of from four to eight ounces; after this a healthy child should gain from four to eight ounces a week up to the sixth month. From six to twelve months the gain is less, usually from two to four ounces a week.

Is it to be expected that bottle-fed infants will gain as rapidly as those who are nursed?

Frequently they do not do so during the first two or three months; after that time under favorable circumstances the gain is usually quite as regular, and during the latter half of the first year it is likely to be more continuous than in a nursing infant, because the latter usually loses in weight at the time of weaning.

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For a child of average weight at birth (seven to seven and a half pounds) what should be the weight at the different periods during the first year?

At three months it should be twelve to thirteen pounds; at six months, fifteen to sixteen pounds; at nine months, seventeen to eighteen pounds; at one year, twenty to twenty-one pounds. At five months a healthy child will usually double its weight, and at twelve months it will usually treble its weight.

Is it true that every infant who gains rapidly in weight is thriving normally?

Not invariably. Some who are fed upon prepared infant foods increase rapidly in weight but not in strength, nor in their development in other respects.

Should a perfectly healthy child gain steadily in weight during the first year?

There are few if any exceptions to this rule. The amount of gain is variable, but the gain should be continuous. Except in the case of a very delicate child one should not be satisfied with a weekly gain of less than four ounces during the first six months.

At what age should the fontanel close?

The average is about eighteen months. It seldom closes earlier than fourteen months, and should it remain open at two years something is wrong.

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At what age should a child hold up its head?

As a rule during the fourth month, and often during the third month, the head can be held erect when the body is supported.

At what age should a child be able to sit and stand alone?

At seven months a healthy child is usually able to sit erect and support the body. During the ninth and tenth months are usually seen the first attempts to bear the weight upon the feet, and at eleven or twelve months a child should stand with assistance.

When should a child walk alone?

The first attempts are generally seen in the twelfth or thirteenth month. At fourteen or fifteen months the average child is able to run alone.

What conditions postpone walking?

Any severe or prolonged illness, a very feeble condition of health, and rickets.

Should a child be urged to walk?

Never; he is usually quite willing to do so as soon as his muscles and bones are strong enough. None of the contrivances for teaching children to walk are to be advised.

When do children begin to talk?

Generally at one year a child can say "papa" and "mamma" or other single words. At the end of the

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second year the average child is able to put words together in short sentences.

If at two years the child makes no attempt to speak, what should be suspected?

Either that the child is a deaf-mute or that it is mentally deficient, although this is occasionally seen in children who are only very backward.

*Table showing the Average Weight, Height, and Circumference of Head and Chest of Boys.**

At birth.....	Weight.....	7½ pounds.
	Height.....	20½ inches.
	Chest.....	13½ "
	Head.....	14 "
One year.....	Weight.....	20½ pounds.
	Height.....	29 inches.
	Chest.....	18 "
	Head.....	18 "
Two years....	Weight.....	26½ pounds.
	Height.....	32½ inches.
	Chest.....	19 "
	Head.....	19 "
Three years...	Weight.....	31 pounds.
	Height.....	35 inches.
	Chest.....	20 "
	Head.....	19½ "

* The weights for the first four years are without clothes; those for five years and after are with ordinary house clothes.

The weight of girls is on the average about one pound less. They are about the same in height.

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Four years...	Weight.....	35 pounds.
	Height.....	38 inches.
	Chest.....	20½ "
	Head.....	19½ "
Five years....	Weight.....	41 pounds.
	Height.....	41½ inches.
	Chest.....	21½ "
	Head.....	20½ "
Six years.....	Weight.....	45 pounds.
	Height.....	44 inches.
	Chest.....	23 "
Seven years...	Weight.....	49½ pounds.
	Height.....	46 inches.
	Chest.....	23½ "
Eight years...	Weight.....	54½ pounds.
	Height.....	48 inches.
	Chest.....	24½ "
Nine years....	Weight.....	60 pounds.
	Height.....	50 inches.
	Chest.....	25 "
Ten years....	Weight.....	66½ pounds.
	Height.....	52 inches.
	Chest.....	26 "

DENTITION.

How many teeth are there in the first set?

Twenty.

What is the time of their appearance?

The two central lower teeth are usually the first to appear, and come from the fifth to the ninth month; next are the four upper central teeth, which come from the eighth to the twelfth month. The

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other two lower central teeth and the four front double teeth come from the twelfth to the eighteenth month. Then follow the four canine teeth, the two upper ones being known as the "eye teeth," and the two lower as the "stomach teeth"; they generally come between the eighteenth and the twenty-fourth month. The four back double teeth, which complete the first set, come between the twenty-fourth and thirtieth month.

At one year a child usually has six teeth.

At one and a half years, twelve teeth.

At two years, sixteen teeth.

At two and a half years, twenty teeth.

What are the causes of variation?

The appearance of teeth varies in different families; in some they come very early, in others much later. The teeth may come late as a result of prolonged illness and also from rickets.

What symptoms are commonly seen with teething?

In healthy children there are very often fretfulness and poor sleep for two or three nights; there may be loss of appetite, so that only one half the usual amount of food is taken; there is salivation or drooling, and often slight fever; there may be some symptoms of indigestion, such as vomiting or the appearance of undigested food in the stools. In

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delicate children all these symptoms may be much more severe.

How long do these symptoms last?

Usually only three or four days.

What is the cause of most of the other symptoms attributed to teething?

Nearly all of them come from indigestion due to bad feeding.

NURSING.

How often should infants be nursed during the first two days of life?

Usually only four or five times daily, since there is very little milk secreted at this time.

When does the milk come in abundance?

Usually on the third day, sometimes not until the fourth or fifth day.

Should the infant be fed anything during the first two days?

Usually not; if much food were necessary, we may be sure Nature would have provided it. Water may be given if the infant shows signs of thirst.

How frequently should an infant be nursed during the first week?

After the third day, every two hours during the day and twice during the night.

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How frequently during the later weeks of infancy?

The intervals should be made exactly the same as those given elsewhere for artificial feeding.

How long should the child be kept at the breast for one nursing?

Not over twenty minutes.

Should the child take both breasts at one nursing?

If the milk is very abundant one breast may be sufficient, otherwise both breasts may be taken.

What are the important things to be attended to in nursing?

First, regularity; it is just as important as in the case of bottle-feeding. Secondly, the nipples should be kept clean by being washed after every nursing.

What should be the diet of a nursing mother?

She should drink plenty of milk and gruel and eat an abundance of simple food, including meat, vegetables, fruits, but very little tea or coffee, and ordinarily no wine or beer.

Are sour fruits likely to disturb a nursing infant?

Not unless they produce symptoms of indigestion in the mother.

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What things in the mother are most likely to cause colic and indigestion in a nursing infant?

Extreme nervousness, fright, fatigue, grief, or passion are the most common causes; sometimes menstruation.

What symptoms indicate that a nursing infant is well nourished?

The child has a good color, sleeps for two or three hours after nursing, or, if awake, is quiet, good-natured, and apparently comfortable. It gains steadily in weight.

What are the symptoms which indicate that a child who is nursing is not nourished?

It does not gain in weight, cries frequently, sleeps irregularly and always in short naps, suffers from colic, and the movements contain undigested food. Often it will nurse a long time at the breasts, sometimes three quarters of an hour, before stopping. At other times, if the milk is very scanty, it may take the breast for a moment only, and then turn away in apparent disgust.

Is there any objection to a baby being partly nursed and partly fed?

None whatever; it is often better to feed the baby during the night, in order not to disturb the sleep of the mother.

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WEANING.

At what age should the child be weaned from the breast?

Usually weaning should be begun at nine or ten months by substituting one feeding a day for one nursing, later two feedings, and thus gradually the child is to be taken from the breast altogether.

At what age should the weaning be completed?

Generally at one year. In summer it may sometimes be advisable to nurse an infant a little longer rather than wean in warm weather; but even then the dangers of weaning are much less than those of continuing to nurse, as is so often done, after the milk has become very scanty and poor in quality.

How may some of the difficulties in weaning be overcome?

By feeding every nursing infant once a day or by giving it water regularly from a feeding-bottle. It then becomes accustomed to the bottle. This is a matter of great convenience during the whole period of nursing when the mother or nurse is from necessity away from the child for a few hours, and when more feeding is required at weaning time the child does not object.

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Can a baby just weaned take cow's milk of the same proportions as one of the same age who has had cow's milk from birth?

Very rarely; to give a baby who has had nothing but the breast from birth, plain cow's milk, or even that milk which a bottle-fed baby of the same age might take, is almost certain to cause indigestion. The change in the food is quite a marked one, and should be made gradually by beginning with a very weak milk and increasing its strength as the baby becomes accustomed to take cow's milk.

What would be the proper proportions for an infant weaned at four or five months?

It is well to begin with those of Formula I (page 41), the quantity of food being of course as large as that given in the schedule (page 57) for a baby of four or five months. After a few days the proportions of Formula II may be used; after another week, those of Formula III; and at the end of two weeks more, those of Formula IV.

What would be the proper proportions for an infant weaned at nine or ten months?

One may then begin with Formula II (page 42) and, if all goes well, increase at the end of a week to Formula III; in another week to Formula IV, etc.; the amount of food being in all cases the same as for a baby who has had nothing but the bottle.

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Will not a child lose in weight when placed upon so low a diet?

Very often it will do so for the first week or two, but after that will gain quite regularly; the acute indigestion, however, which generally accompanies the use of stronger milk will, in most cases, cause a greater loss.

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II.

INFANT FEEDING.

What is the best infant food?
Mother's milk.

Of what is mother's milk composed?
Thirteen parts solids and eighty-seven parts water.

What are the solids?
Fat, sugar, proteids, and salts.

What is the fat?
The cream.

What is the sugar?
It is lactose, or milk sugar.

What are the proteids?
The curd of the milk.

Are all these elements necessary?
Yes; we can not expect to rear a healthy infant unless they are all in his food.

Of what use is the fat?
It is needed for the growth of the bones, the nerves, the fat of the body, and the production of heat.

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Of what use is the sugar?

It is needed for the production of heat, and to produce fat in the body.

Of what use are the proteids?

They are needed for the growth of the cells of the body, such as those of the blood, the various organs, and the muscles.

Of what use are the salts?

Particularly for the growth of bone.

SUBSTITUTES FOR MOTHER'S MILK.

What foods contain all the elements mentioned?

The milk of other animals,—cow's milk being the only one which is available for use.

What are the essentials in cow's milk that is to be used for infant feeding?

That it shall be fresh, clean, and from healthy cows; it is better from a mixed herd than from a single animal.

Why is mixed milk better than that from one cow?

Because the milk of a single cow often varies considerably from day to day, while a mixed milk remains practically the same.

Is it not possible for infants to thrive upon other foods than those containing fresh milk?

They may appear to do so for a time, but never permanently.

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Can cow's milk be fed to infants without any changes?

No; for although it contains essentially the same elements as mother's milk, they are not in the same proportions.

Is this a matter of much importance?

It is of the greatest importance. There are very few young infants who can digest cow's milk unless it is changed.

In what respect does cow's milk differ from mother's milk?

Cow's milk contains nearly three times as much proteids (curd), and a little more than half as much sugar.

THE MODIFICATION OF COW'S MILK.

What is meant by the modification of cow's milk?

Changing the proportions of the different ingredients until they resemble those of mother's milk; the important changes required being to diminish the proteids and to increase the sugar.

How are the proteids diminished?

By diluting the milk.

How much should cow's milk be diluted to give the proper proportion of proteids?

For a baby under two weeks old, five times; for a baby from two weeks to six weeks old, four times;

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for a baby from six weeks to twelve weeks old, three times; for a baby from twelve weeks to four months old, twice; for a baby from four months to nine months old, once; for a baby of one year, usually not at all.

What is meant by diluting five times?

That one part of the milk is used to five parts of water—i. e., the food is one sixth milk.

Is the dilution the only modification necessary?

No; milk which has been so diluted contains too little sugar and too little fat.

How is the lack of sugar overcome?

By diluting with a solution of sugar instead of plain water.

How should the sugar solution be prepared?

By dissolving milk sugar in boiling water.

How strong should such a solution be made?

One even tablespoonful to each eight ounces of the food; if a child were taking eight feedings of four ounces each, or thirty-two ounces of food daily, there would be required for the sugar solution four even tablespoonfuls of milk sugar.

What percentage of sugar would this make in the food?

Between six and seven per cent.

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Why should the water be boiling?

(1) To be sure that it is sterilized; (2) milk sugar is not very soluble in cold water.

When and how should this solution be filtered?

If the solution is not clear, or if there is a deposit after standing; these indicate impurities. The solution is best filtered by pouring it through a layer of absorbent cotton, half an inch thick, which is placed in an ordinary funnel.

How long will the sugar solution keep?

It should be prepared every day.

Will not cane (granulated) sugar answer as well?

Not as a rule; however, there are a good many infants who get on very well when cane sugar is used. It has the advantage of being much cheaper. A good grade of milk sugar is somewhat expensive, costing from twenty-five to sixty cents a pound, and cheap samples are apt to contain impurities.

If cane sugar is used, what amount should be added?

Considerably less than of the milk sugar. Usually one even tablespoonful to twelve ounces of the food. Sometimes one tablespoonful to sixteen ounces of the food is as much as the child can digest. If the same quantity is used as of the milk sugar, the food is

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made unduly sweet, and the sugar is likely to ferment in the stomach and cause colic.

Is not the purpose of the sugar to sweeten the food in order to make it palatable?

Not at all; although it does that, its real use is to furnish one of the essential elements needed for the growth of the body, and the one that is required by young infants in the largest quantity.

How do we know that this is so?

By the fact that in good breast milk the amount of sugar is greater than that of the fat, proteids, and salts combined.

If in the modification of cow's milk the plain milk be used for dilution, we have already seen (page 36) that the food will contain too little fat. How can this difficulty be overcome?

By using for dilution a mixture of milk and cream, or a top milk. Such a mixture or such a top milk is known as the *primary formula.*

What should the primary formula for the first month contain?

About three times as much fat as proteids. The one most conveniently obtained contains twelve per cent fat and four per cent proteids. This is known simply as the "twelve-per-cent milk."

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How can one get this?

Either by taking equal parts of plain milk and ordinary cream (containing about twenty per cent fat) or directly as a twelve-per-cent top milk. If the very thick or "heavy" cream is used, the proportions should be three parts milk to one part cream.

How can a twelve-per-cent top milk be obtained?

The best way is to place the fresh milk in a tall glass jar, such as a fruit jar or a milk bottle, and let it stand on ice or in a cold room for four or five hours. The upper one fifth (six ounces from one quart) may be calculated to contain twelve per cent fat. If the milk is very rich, the upper one fourth (eight ounces from one quart) may be used. If milk is used which has been bottled at a dairy the day before, the upper one fourth (eight ounces from one quart) may be calculated to contain twelve per cent fat. This top milk may either be removed by skimming or the bottom layer of milk may be siphoned off, leaving the number of ounces of top milk desired. Should more than six ounces of the twelve-per-cent milk be needed, two quarts of milk should be set.

Is it better to obtain the primary formula by using a mixture of milk and cream, or as top milk?

If one can get milk fresh from the cows, the top milk is to be preferred on account of freshness. The food can then be made up when the milk is but a few

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hours old. In cities, however, where one buys milk and cream it is usually more convenient to mix these, as the cream will not rise upon milk a second time with any uniformity.

Stated briefly, how should milk be modified during the early months?

The first step is to obtain the primary formula (the twelve-per-cent milk); the second, to dilute this with a solution of milk sugar,—for the first two weeks diluting five times, from the third to the sixth week diluting four times, from the sixth to the twelfth week three times, from the twelfth to the eighteenth week twice.

Are there any other changes necessary in cow's milk when it is to be used as a food for young infants?

Yes; the reaction of cow's milk is acid. This should be overcome by the addition of lime water or bicarbonate of soda.

How much of each is required?

Of lime water, one ounce to each sixteen or twenty ounces of the food; of bicarbonate of soda, one quarter of an even teaspoonful to the same quantity.

What is Formula I?

Fat, 2 per cent; sugar, 6 per cent; proteids, 0·6 per cent.

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How is this obtained?

By diluting the primary formula (twelve-per-cent milk) five times with the solution of milk sugar.

Give the quantities of each of the different ingredients (milk, cream, milk sugar, etc.) required to make twelve, sixteen, twenty, and twenty-four ounces respectively of this formula when the food is made at home.

Formula I (third to fourteenth day).

Ingredients.	Quantity of each required to make			
	12 oz.	16 oz.	20 oz.	24 oz.
Milk.....(ounces)	1	1½	1½	2
Cream.....(ounces)	1	1½	1½	2
Limewater.....(ounces)	¾	1	1¼	1½
Water.....(ounces)	9½	12½	15½	18½
Milk sugar (even tablespoonfuls)	1½	2	2½	3

How would the directions differ if top milk were used?

The quantity of top milk should be equal to the milk and cream combined.

When and how is Formula I to be used?

It may be begun on the third or fourth day of life and continued until the end of the second week, the quantity being gradually increased during this period according to the vigor of the child and its powers of digestion. The amounts mentioned are those needed

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for twenty-four hours. There are required at this time ten feedings in twenty-four hours, which should be given every two hours from 7 A. M. to 10 P. M., and every four hours between 10 P. M. and 7 A. M.

What is Formula II?

Fat, 2·5 per cent; sugar, 6 per cent; proteids, 0·8 per cent.

How is this obtained?

By diluting the primary formula (twelve-per-cent milk) four times with the solution of milk sugar.

Give the quantities of the different ingredients (milk, cream, milk sugar, etc.) needed to make twenty, twenty-four, twenty-eight, and thirty-two ounces respectively of this formula.

Formula II (second to sixth week).

Ingredients.	Quantity of each required to make			
	20 oz.	24 oz.	28 oz.	32 oz.
Milk.....(ounces)	2	2½	3	3½
Cream.....(ounces)	2	2½	3	3½
Limewater.....(ounces)	1½	1½	1½	2
Water.....(ounces)	14½	17½	20½	23½
Milk sugar (even tablespoonfuls)	2½	3	3½	4

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How would directions differ if top milk were used?

The quantity of top milk should be equal to that of the milk and cream combined.

When and how should Formula II be used?

From the end of the second to the end of the fifth week. There are required at this time ten meals during the twenty-four hours, given as above, every two hours by day and every four hours by night.

Under what circumstances will the different quantities be required?

A small child or one with weak digestion will usually require from twenty to twenty-four ounces of food daily; a larger or more robust child may begin with twenty ounces, the amount being gradually increased to thirty-two ounces at the end of the sixth week.

What is Formula III?

Fat, 3 per cent; sugar, 6 per cent; proteids, 1 per cent.

How is this obtained?

By diluting the primary formula (twelve-per-cent milk) three times with the solution of milk sugar.

Give the quantities needed to make twenty-four, twenty-eight, thirty-two, and thirty-six ounces

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respectively of this formula, using milk and cream).

Formula III (sixth to eleventh week).

INGREDIENTS.	QUANTITY OF EACH REQUIRED TO MAKE			
	24 oz.	28 oz.	32 oz.	36 oz.
Milk.....(ounces)	3	3½	4	4½
Cream.....(ounces)	3	3½	4	4½
Limewater.....(ounces)	1½	1½	1½	1½
Water.....(ounces)	16½	19½	22½	25½
Milk sugar (even tablespoonfuls)	3	3½	4	4½

How would directions differ if top milk were used?

The quantity of top milk should be equal to that of the milk and cream combined.

When and how should Formula III be used?

From the beginning of the sixth to the end of the tenth week. In twenty-four hours eight feedings are required. These should be given every two hours and a half, from 7 A. M. to 10 P. M., and one feeding between 10 P. M. and 7 A. M.

Under what circumstances will the different quantities be required?

An average child should start with twenty-four ounces at the beginning of this period, and the quantity should gradually be increased to thirty-two ounces. A large or very robust child should start with twenty-

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four or twenty-eight ounces at six weeks, gradually increased by the tenth week to thirty-six ounces.

What is Formula IV?

Fat, 3·5 per cent; sugar, 7 per cent; proteids, 1·5 per cent.

How can this be obtained?

By diluting two parts of a nine-per-cent milk with three parts of the sugar solution.

Give the quantities of the different ingredients required to make twenty-eight, thirty-five, and forty-two ounces, respectively, using milk and cream.

Formula IV (tenth week to fifth month).

Ingredients.	Quantity of each required to make		
	28 oz.	35 oz.	42 oz.
Milk.....(ounces)	8	10	12
Cream.....(ounces)	3½	4	5
Limewater.....(ounces)	1½	1½	2
Water.....(ounces)	15	19½	23
Milk sugar (even tablespoonfuls)	3½	4½	5½

How would directions differ if top milk were used?

Approximately by taking the upper fourth of ordinary milk, or the upper third of a very rich milk, after standing, as described on page 39. The amount of top milk should be the same as that of the milk and cream combined.

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At what age and how should Formula IV be used?

It may generally be begun at the tenth week and continued until the end of the fourth month. During this period seven feedings should be given in twenty-four hours, one every three hours between 7 A. M. and 10 P. M., and one feeding between 10 P. M. and 7 A. M.

When will the different quantities be required?

An average child will take twenty-eight ounces daily at the beginning, and thirty-five ounces daily by the end of this period. A robust child will often begin with thirty-five ounces and at the end take forty-two ounces.

What is the primary formula from which the milk may be prepared after the fourth month?

One which contains eight per cent fat and four per cent proteids; or, as it is called, the "eight-per-cent milk."

How is an eight-per-cent milk obtained?

Either by taking one part of ordinary cream (containing about twenty per cent fat) and three parts of plain milk, or one part of very thick cream and seven parts of milk, or directly, as an eight-per-cent top milk. For the latter the same plan is followed as in getting a twelve-per-cent top milk (page 39), except that after standing four or five hours the upper third

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(ten ounces from one quart) may be taken; or, if the milk is very rich, twelve ounces. If milk which has been bottled the day before is used, from ten to fourteen ounces, according to its richness, may be taken.

What is Formula V?

Fat, 4 per cent; sugar, 7 per cent; proteids, 2 per cent.

How can this be obtained?

By diluting the primary formula (eight-per-cent milk) once with the solution of milk sugar.

Give the quantities of the different ingredients required to make thirty, thirty-six, forty-two, and forty-eight ounces, respectively, of the formula, using milk and cream.

Formula V (five to ten months).

Ingredients.	Quantity of each required to make			
	30 oz.	36 oz.	42 oz.	48 oz.
Milk.....(ounces)	11½	13½	15¾	18
Cream.....(ounces)	3¾	4½	5¼	6
Limewater.....(ounces)	1½	1½	2	2
Water.....(ounces)	13½	16½	19	22
Milk sugar (even tablespoonfuls)	4	4½	5½	6½

How would the directions differ if top milk were used?

The amount of the top milk should be the same as of the milk and cream combined.

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At what age, and how, should Formula V be used?

It may usually be begun at the fifth month and continued until the end of the ninth month, without other change than gradually increasing the quantity. It should be given every three hours from 7 A. M. to 10 P. M., but no feeding between 10 P. M. and 7 A. M.

THE CHANGES IN THE FOOD REQUIRED BY SPECIAL SYMPTOMS OR CONDITIONS.

Why is it that a child so often vomits within a few moments after finishing its bottle?

Usually because the quantity is too large. Sometimes it is due to the fact that the food is taken too rapidly, owing to a large hole in the nipple. It may be due to too tight clothing, or to moving the child about in such a way as to press upon the stomach.

What is usually at fault when a child regurgitates, or spits up, a mouthful or two of sour milk several times a day between his feedings?

In most cases the amount of cream is too large. This should be reduced by taking, instead of equal parts of milk and cream, as in Formulas I, II, and III, twice or three times as much milk as cream, and sometimes by using all milk.

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When the child suffers from habitual colic, how should the milk be changed?

This in most cases depends upon the fact that the proteids of the milk (the curd) are not digested. They should be diminished by further dilution. This may be accomplished by using a weaker formula than would be ordinarily required for a child of the age. If this is done, the quantity of food allowed should be somewhat greater than that specified in the formula.

What change should be made if curds appear in the stools regularly or frequently?

This is usually associated with habitual colic, and has to be managed exactly like that condition, by the means just described.

How should the milk be modified for chronic constipation?

It is often difficult to overcome this by changes in the food alone; but in many cases some good may be done by using a larger proportion of cream and a slightly smaller proportion of milk than is called for in the preceding formulas.

What special modifications are required by very hot weather?

During the warm season it is well to make the proportion of cream less than during cold weather. During short periods of excessive heat it should be much less. At such times also the usual food should

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be diluted, and water should be given freely between the feedings.

What changes should be made in the food of a child who, with all the signs of good digestion, gains very little or not at all in weight?

The quantity of food should be increased; but if the child will not (readily) take any more in quantity, the strength should be increased by adding more milk and more cream.

By what signs does an infant show that it wants more food?

It drains the bottle greedily at each feeding, cries when it is taken away, and often puts the fingers into the mouth. Some time before the next feeding is due it begins to fret and worry.

Should the quantity or the strength of the food then be increased?

It is usually best first to increase the daily quantity by four to six ounces; but if a child is already taking the largest quantity mentioned in the preceding formulas, he should be put upon the next stronger formula.

What changes are required for infants who habitually sleep badly?

This is a very complicated condition, and may be

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due to indigestion resulting from too much food, or to hunger produced by too little food, or simply to frequent feeding at night. Each one of these requires special treatment.

What changes in the food are required by slight indisposition?

The strength of the food should always be reduced, this being accomplished most easily by adopting a weaker formula than the one which the child is taking —e. g., if the child is having Formula III, changing to Formula II. The quantity should also be somewhat reduced.

What immediate change should be made if a baby vomits a large part of its food?

It is well to omit the next feeding altogether, and make the following one much weaker than usual. If the vomiting is repeated, all food should be stopped and only water given for six or eight hours, or until the doctor comes.

What changes are necessary in cases of acute illness?

The strength of the food should be greatly reduced, but the quantity not necessarily diminished, for if there is fever the child will usually require and take readily a large amount of water.

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When a baby's appetite fails so that it takes much less than usual, should the strength of the food be increased or diminished?

As a rule, it should be diminished; otherwise a condition of slight derangement is often prolonged. If this plan is followed, after a few days the appetite will usually return.

PREPARATION OF COW'S MILK AT HOME.

What articles are required for the preparation of cow's milk at home?

Feeding-bottles, rubber nipples, an eight-ounce graduated measuring glass, a glass or agate funnel, bottle brush, cotton, alcohol lamp or, better, a Bunsen gas burner, a tall quart cup for warming bottles of milk, a pitcher for mixing the food, a wide-mouth bottle for boric acid and one for bicarbonate of soda, and a pasteurizer. Later, a double boiler for cooking cereals will be needed.

What bottles are to be preferred?

A cylindrical graduated bottle with a rather wide neck, so as to admit of easy washing, and one which contains no angles or corners. A single size holding eight ounces is quite sufficient for use during the first year. All complicated bottles are bad, being difficult to clean. One should have as many bottles in use as the child takes meals a day.

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How should bottles be cared for?

As soon as they are emptied they should be rinsed with cold water and allowed to stand filled with water to which a little bicarbonate of soda has been added. Before the milk is put into them they should be thoroughly washed with a bottle brush and hot soapsuds and then placed for twenty minutes in boiling water.

What sort of nipples should be used?

Only simple straight nipples which slip over the neck of the bottle. Those with a rubber or glass tube are too complicated and very difficult to keep clean. Nipples made of black rubber are to be preferred. The hole in the nipple should not be so large that the milk will run in a stream, but just large enough for it to drop rapidly when the bottle with the nipple attached is inverted.

How should nipples be cared for?

After using they should be rinsed in cold water and then kept in a solution of borax or boric acid, and carefully washed three or four times a day.

What sort of cotton should be used?

The refined non-absorbent cotton is rather better for stoppering bottles, but the ordinary absorbent cotton will answer every purpose.

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Which is better, the Bunsen burner or the alcohol lamp?

If there is gas in the house, the Bunsen burner is greatly to be preferred, being cheaper, simpler, and much safer than the alcohol lamp. If the lamp is used, it should stand upon a table covered with a plate of zinc or tin, or upon a large tin tray.

Give the directions for preparing the food according to any of the above formulas.

Dissolve milk sugar in boiling water, filtering if necessary. Then add the milk and cream and lime-water, mixing the whole in a pitcher. A sufficient quantity of food for twenty-four hours is always to be prepared at one time. This is then divided into the number of feedings required for the day, each feeding being put in a separate bottle, and the bottle stoppered with cotton. The bottles should then be cooled rapidly by standing, first in tepid then in cold water, and afterward placed in an ice chest. If the milk is to be pasteurized or sterilized, this should precede the cooling.

DIRECTIONS FOR FEEDING INFANTS.

How should the bottle be prepared at feeding time?

It should be taken from the ice chest, and warmed by standing in warm water which is deep enough to

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cover the milk in the bottle; it should then be thoroughly shaken and the nipple adjusted; the nurse should see that the hole in the nipple is not too large nor too small.

How may the temperature of the milk be tested?

Never by putting the nipple in the nurse's mouth. Before adjusting the nipple, a teaspoonful may be poured from the bottle and tasted, or a few drops may be poured through the nipple upon the inner surface of the wrist, where it should feel quite warm but never hot; or a thermometer may be placed in the water in which the bottle stands. A dairy thermometer should be used, and the temperature of the water should be between 98° and 105° F.

What is a simple contrivance for keeping the milk warm during feeding?

A small flannel bag with a draw string may be slipped over the bottle.

In what position should an infant take its bottle?

Most infants during the first three months should be held on the nurse's arm during the feeding; after this age they may lie in the crib, provided the bottle is held by the nurse until it has been emptied; otherwise a young infant readily falls into the habit of alternately sucking and sleeping, and often will be an hour or more over its bottle.

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How much time should be allowed for one feeding?

Never more than twenty minutes. The bottle should then be taken away and not given until the next feeding time. Under no circumstances should an infant form the habit of sleeping with the nipple in its mouth. A sleepy infant should be kept awake by gentle shaking until the food is taken, or the bottle should be removed altogether.

Should an infant be played with soon after feeding?

On no account; such a thing frequently causes vomiting and sometimes indigestion. After every feeding the infant should be allowed to lie quietly in its crib, and disturbed as little as possible.

INTERVALS OF FEEDING.

How often should a baby be fed during the first month?

Every two hours during the day and twice during the night, or ten feedings during the twenty-four hours.

At what age may the interval be made two and a half hours?

At five weeks.

When may it be increased to three hours?

Usually at two and a half months.

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Why should not a child be fed more frequently?

It takes the stomach nearly two hours to digest a meal at two months, and about two and a half hours at five or six months, and if the meals are too near together, the second one is given before the first has been digested and vomiting and indigestion result. The meals should be far enough apart to give the stomach a little time for rest just before each feeding.

Schedule for Feeding a Healthy Child during the First Nine Months.

Formula.	Age.	No. of feedings in 24 hours.	Interval between feedings by day.	No. of night feedings (10 P. M. to 7 A. M.).	Quantity for one feeding.	Quantity for 24 hours.
I.	2 to 14 days.	10	2 hrs.	2	1–2½ oz.	10–25 oz.
II.	2 wks. to 5 wks.	10	2 "	2	2–3½ "	20–32 "
III.	5 wks. to 10 wks.	8	2½ "	1	3–4½ "	24–36 "
IV.	10 wks. to 4 mos.	7	3 "	1	4–6 "	28–42 "
V.	4 mos. to 9 mos.	6	3 "	0	5–8 "	30–48 "

REGULARITY IN FEEDING.

How can a baby be taught to be regular in its habits of eating and sleeping?

By always feeding at regular intervals and putting to sleep at exactly the same time every day and evening.

When should regular training be begun?

During the first week of life.

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Should a baby be wakened to be nursed or fed if sleeping quietly?

Yes, for a few days. This will not be required long, for with regular feeding an infant soon wakes regularly for its meal, almost upon the minute.

Should regularity in feeding be kept up at night as well as during the day?

Only up to nine or ten o'clock; after that time a baby should be allowed to sleep as long as it will.

At what age may a well baby go without food from 10 P. M. *to* 6 *or* 7 A. M.*?*

Usually at four months, and always at five or six months. Night feeding is one of the most frequent causes of wakefulness and disturbed sleep.

OTHER FOOD THAN MILK DURING THE FIRST YEAR.

How long should a child be kept upon the milk elements (milk, cream, milk sugar, etc.)?

Generally until eight or nine months old; sometimes, if the child has special difficulty in digesting milk, other things may be begun earlier—i. e., at five or six months.

What else than milk may be used during the first year?

Beef juice, farinaceous food, and sometimes orange juice.

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How should the beef juice be given?

Beginning at ten months with one tablespoonful, it may be gradually increased until, at twelve months, the child takes from four to six tablespoonfuls daily.

When should it be given?

Generally just before the midday meal. (For preparation, see page 77.)

In what form may farinaceous food be given?

Either in the form of a thick jelly, of which at first one tablespoonful and later three or four tablespoonfuls may be added to each feeding, or as a thin gruel, which may take the place of the whole or a part of the water in Formulas III, IV, or V.

The jelly or the gruel may be made directly from the grains of oats, wheat, or barley, from farina or arrowroot, or from some of the varieties of prepared flour or farinaceous foods which are sold, such as the oat or barley flour of the Health Food Company, Robinson's patent barley, Hubbell's prepared wheat flour, imperial granum, etc. (For preparation, see page 79.)

Why should farinaceous food be withheld until the last half or quarter of the first year?

Because the organs which digest such food are very imperfectly developed in a young infant, and if much of it is given very serious disturbance often results.

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When may orange juice be begun?

Usually by the eleventh or twelfth month; it should be given about one hour before the feeding, one or two tablespoonfuls at one time. It is particularly useful where there is constipation; it should be strained through muslin to be sure that the baby gets only the juice of the fruit.

STERILIZED MILK.

What is meant by sterilizing milk?

Heating milk for the purpose of destroying germs.

Does all cow's milk contain germs?

Yes; even when handled most carefully, milk contains many germs; but when carelessly handled, and in summer, the number is very large. While most of these are harmless or cause only the souring of milk, others are occasionally present which may produce serious diseases such as typhoid fever, diphtheria, scarlet fever, cholera, tuberculosis, and many forms of diarrhœa.

Under what circumstances is it necessary to sterilize milk?

1. In warm weather when it can not be obtained fresh; hence always in cities during the summer.

2. When one can not be certain that the cows are healthy, or that the milk has been carefully handled.

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3. When the milk is to be kept for any considerable time (i. e., over twenty-four hours), especially if no ice can be had.

What are the two methods of heating milk?

The first is known as *sterilizing*, where the milk is heated to 212° F. for one hour or one hour and a half; the second is known as *pasteurizing*, where the milk is heated to 155° or 170° F. for thirty minutes. A temperature of 155° F. continued for thirty minutes is sufficient to kill the germs of the diseases above referred to.

Will milk which has been thus heated keep indefinitely?

No; for although all the living germs may be killed, there are many undeveloped germs, or spores, which are not destroyed, and which soon grow into living germs. Milk heated to 212° F. for an hour will keep upon ice for two or three weeks; that heated to 155° F. for two or three days.

Is cow's milk rendered more digestible by being heated in this way?

Probably in no respect; it should be modified in the same way as milk which has not been heated.

Is milk in any way injured by heating to 212° F. for an hour and a half?

There seems to be pretty good evidence that the milk is rendered less digestible by such heating; also

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that it is more constipating, and that, for some children its nutritive properties are interfered with, but this is not seen unless it is continued as the sole food for a long period. These objections are of so much importance that this plan of heating milk is not to be recommended for general use.

When is it advantageous to heat milk to 212° *F.?*

For use upon long journeys, such as crossing the ocean. Milk should then be heated for one hour upon two successive days, without removing the cotton stoppers from the bottles.

Is milk in any way injured by heating to 155° *F. for thirty minutes?*

This has not been shown to produce any of the unfavorable effects just mentioned, and it does not affect the taste of the milk. It is to be recommended for general use under the circumstances mentioned on page 60.

How should milk be pasteurized?

The most convenient form of apparatus is that known as Freeman's pasteurizer.*

How should milk be cooled after pasteurizing?

Always by placing the bottles first in tepid and

* This can be obtained at 411 West Fifty-ninth Street, New York, with full directions; a tin one, at a cost of three dollars, and a copper one, which is much more durable, for six dollars.

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then in cold water, so as to cool them rapidly; never by letting them stand at the temperature of the room, or by placing them, when warm, in an ice box.

Why is this precaution necessary?

Cooling in the air or in an ice box requires from two to four hours, and during that time a great many of the undeveloped germs may mature and greatly injure the keeping properties of the milk. In the cold water, milk can be cooled in from ten to twenty minutes if the water is frequently changed, or if ice is added to the water.

PEPTONIZED MILK.

What is peptonized milk?

Milk in which the proteids (curd) have been partially digested.

How is this accomplished?

By the action of a peptonizing powder which is composed of a digestive agent known as the extractum pancreatis and bicarbonate of soda, which is added to the plain or diluted milk. This is sold in tubes or in tablets, and it is the active ingredient of the peptogenic milk powder.

Describe the process.

The plain or modified milk is placed in a clean glass jar or bottle, and the peptonizing powder, which

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is first rubbed up with a tablespoonful of the milk, is added and the bottle shaken. The bottle is then placed in a large pitcher or basin containing water at the temperature of about 115° F., or as warm as the hand can bear comfortably, and left for ten to twenty minutes if the milk is to be partially peptonized; for two hours if it is to be completely peptonized.

What taste has partially peptonized milk?

None, if it is continued for only ten minutes, but at the end of twenty minutes it begins to be bitter, indicating that the process of digestion has gone further.

How is the bitter taste avoided in partially peptonized milk?

At the end of ten or fifteen minutes the milk may be placed in a saucepan and quickly raised to boiling point; this kills the ferment, so that the milk will not become bitter when warmed a second time. Or, the milk may be rapidly cooled by placing the bottles first in cool and then in ice water; in this way the ferment is not destroyed, and the milk may become bitter when warmed for feeding.

Should the whole day's supply be peptonized at once, or each bottle separately just before the feeding?

Either plan may be followed. If the former, it is better to raise the milk to boiling point after pepton-

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izing; if the latter, it should not be peptonized more than ten minutes, for it will continue to peptonize while it is being taken by the child.

Is not the bitter taste of completely peptonized milk a great obstacle to its use?

Not in the case of young infants; one under four or five months old will usually take it without any objection after two or three feedings; but it can not often be used for those who are much older.

How much of the peptonizing powder should be used?

There are required for one pint of plain milk, five grains of the extractum pancreatis and fifteen grains of bicarbonate of soda. This quantity is usually put up in a single tube or tablet. For the diluted milk used in the foregoing formulas less than this quantity is needed: for one pint of Formula I, II, or III, one third of a tube is sufficient, or one twelfth of a tube for each feeding of four ounces; for Formula IV or V, one half of a tube for one pint, or one eighth of a tube for each feeding of four ounces.

What are the advantages of peptonized milk?

Partially peptonized milk is useful for young infants who have great difficulty in digesting the curd of milk, sometimes even when diluted as already described; completely peptonized milk, during acute attacks of indigestion.

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For how long a period may the use of peptonized milk be continued?

Completely peptonized milk should be used for a few days, or at most a few weeks; partially peptonized milk may be used for two or three months, but not indefinitely; it should be left off gradually by shortening the time of peptonizing, and lessening the amount of the powder used.

FEEDING DURING THE SECOND YEAR.

How many meals are required during the second year, and what are the most convenient hours?

It is usually better to continue five meals throughout the second year, the hours being 6.30 and 10 A. M. and 2, 6, and 10 P. M. Some children will sleep from 6 P. M. to 6 A. M. without waking, but unless there is a feeding at 10 P. M. children are apt to wake very early in the morning.

Should each bottle be prepared at the time of feeding, or all bottles at one time, as during the first year?

During the second and third years it is better to prepare the milk for the entire day at one time. If it is to be modified by adding cream, water, etc., it is done exactly as during the first year.

Later, when only plain milk is used, the quantities needed for the different feedings should be put into

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one or two bottles, which then may be pasteurized or not as may be necessary. In this way the different feedings are kept separate, and the day's supply of milk is not disturbed every time the child is fed, as otherwise is unavoidable. The bottles should be prepared as soon as possible after the daily milk supply is delivered in the morning.

Give a proper diet for an average child from the twelfth to the sixteenth month.

First meal: A bottle containing ten ounces, composed of milk, five ounces; cream, one ounce; water, two ounces; and two ounces of thick gruel of wheat, oatmeal, or barley. A pinch of salt and a little granulated sugar should be added.

Second meal: Same as the first.

Third meal: Beef juice, two to four ounces, three times a week; eggs (poached or soft boiled) twice a week; chicken or mutton broth, four to six ounces twice a week; and a bottle containing half the amount given at the first meal.

Fourth meal: Same as the first.

Fifth meal: Same as the first.

What fruit may be given at this period?

Only fruit juices, of which orange juice is the best; next to this the juice of fresh ripe peaches, apricots, or strawberries. All these should be strained very carefully through muslin to make sure that the

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child gets none of the pulp or seeds, both of which may cause serious disturbance. Of the orange or peach juice, from one to four tablespoonfuls may be allowed at one time; of the others about half the quantity. The fruit juice is best given one hour before the second feeding.

When should a child be weaned from its bottle?

Most children can and should be taught to take their food from the cup or spoon by the time they are sixteen months old; but it is usually more convenient to give the 10 P. M. feeding from the bottle during the entire second year.

Give a proper diet for an average child from the sixteenth to the twentieth month.

First meal: Ten to twelve ounces of plain milk, warmed.

Second meal: Two tablespoonfuls of oatmeal, hominy, wheaten grits, or some other cereal, thoroughly cooked and strained, with two ounces of thin cream, and well salted; plain milk, from six to eight ounces.

Third meal: Same as for a child from the twelfth to the sixteenth month, and, in addition, stale bread without butter; prune pulp or baked apple; plain milk, from four to six ounces.

Fourth meal: Farina and milk, from ten to twelve ounces in all, alternating with corn starch, granum, or Mellin's food, and milk.

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Fifth meal: From ten to twelve ounces of plain milk from a bottle.

Orange juice and other fruit juices may be given as during the early part of the second year, and in somewhat larger quantity.

Can not most children take plain milk before they are sixteen months old?

Many can but more can not, or at least they do much better when the milk is modified by the addition of cream, water, etc.

Give a proper diet for an average child from the twentieth to the twenty fourth month.

First meal: Plain milk, from ten to twelve ounces.

Second meal: The same cereals as during the preceding four months, except that they need no longer be strained, but they should still be very thoroughly cooked; plain milk, from six to eight ounces; piece of stale bread.

Third meal: Rare meat pulp (steak, chop, or roast beef), from one teaspoonful to one tablespoonful, well salted, and four ounces of chicken or mutton broth; on alternate days from two to four ounces of beef juice, or a soft egg mixed with bread crumbs or with one tablespoonful of well-cooked rice jelly; stale bread, without butter: and fruit; only water to drink.

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Fourth meal: Farina, granum, barley, or Mellin's food, and milk, from ten to twelve ounces in all.

Fifth meal: From ten to twelve ounces plain milk.

What fruits may be given at this period?

Unless the child has a strong digestion, only the fruit juices previously allowed; strong children may have in addition prune pulp, baked apple, and apple-sauce. The prune pulp is prepared by stewing the dried prunes without sugar until they are very soft, and removing all the skin by putting the fruit through a strainer; of this from one to two tablespoonfuls may be given at one time. The baked apple should be given plain, and the apple-sauce should have very little sugar.

How and when should water be given?

Throughout the second year water should be given freely between the feedings, especially in warm weather; from one to three ounces may be given at one time, either from a spoon, a glass, or a bottle. The water should be boiled daily and then cooled. It should not be allowed to stand in the room, but fresh water should be put into the bottle each time.

FEEDING DURING THE THIRD YEAR.

How many meals are required during the third year?

Usually but four, the 10 P. M. feeding being omitted

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when the child is two years old; otherwise the hours may be about the same as during the second year.

Give a proper diet for an average child during the third year.

Three quarters of an hour before breakfast the juice of an orange.

First meal: Two tablespoonfuls of a well-cooked cereal with cream and salt; stale or dried bread and butter; glass of warm milk; soft egg twice a week.

Second meal: Glass of warm milk, or a cup of chicken or mutton broth, with a slice of stale or dried bread.

Third meal: Broth (when not given at second meal); meat—steak, chop, roast beef, roast lamb—or white meat of chicken, all scraped or very finely cut; potato, baked or boiled and mashed, or rice, or macaroni stewed very soft with milk; asparagus, or fresh peas, or string beans, or spinach, or stewed celery, all thoroughly cooked, and mashed; bread and butter; junket, or plain custard twice a week; on other days prunes or baked apple or apple-sauce.

Fourth meal: From ten to fourteen ounces of warm milk, with bread or farina, arrowroot, barley, corn starch, or granum, and milk, or milk toast.

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ARTICLES ALLOWED FROM THE THIRD TO THE SEVENTH YEAR.

Milk.—This should be the basis of the diet; most children require about one quart daily. This usually needs no modification, but if somewhat difficult of digestion, it should be prepared as for the second year, six ounces of milk, one ounce of cream, and three ounces of water. The milk should usually be given warm.

Cream.—This is of great value, especially when there is a tendency to constipation. From two to six ounces may be given daily. It may be used upon cereals, upon potato, in broths, and mixed with milk. In many cases it is advisable to withhold milk and give only cream.

Eggs.—They should be fresh, soft-boiled or poached, but never fried. Usually eggs should not be given oftener than every other day, as children readily tire of them.

Meats.—Some form of meat should be given once a day. The best forms are beefsteak, mutton chop, and roast beef or lamb; next to these the white meat of chicken, or fresh fish, which should be boiled or broiled. Beef and mutton should be given rare.

Vegetables.—Potato may be given once a day, preferably baked, with the addition of cream or beef

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juice rather than butter. Of the green vegetables the best are asparagus tops, spinach, stewed celery, string beans, fresh peas, and squash. One of these vegetables should be given daily, always well cooked and mashed.

Cereals.—Nearly all these may be used, oatmeal, wheaten grits, hominy, rice, farina, and arrowroot. The most important part of the preparation is thorough cooking. If the grains are used, cereals should be cooked at least three hours, after having been previously soaked several hours; if the prepared (steamed) oats or wheat, they should be cooked at least one hour; the prepared flours, at least fifteen minutes. They should always be well salted, and given with milk or cream, but with little or no sugar.

Broths and Soups.—The meat broths are preferable to the vegetable broths. Nearly all varieties may be given. Plain broths are not very nutritious, but when thickened with arrowroot or cornstarch, and when cream or milk is added, they are very palatable, and at the same time a valuable addition to the diet. Beef juice may be used as directed for the second year.

Bread and Crackers.—In some form these may be given with nearly every meal, with very little butter until the fourth year, as for young children cream is a better form of fat. All varieties of bread may be

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allowed when stale; also dried bread, zwieback, and oatmeal, Graham, or gluten crackers.

Desserts.—The only ones that should be allowed up to the sixth year are junket, plain custard, rice pudding without raisins, and, not oftener than once a week, ice-cream. Of the last three, the quantity given should be very moderate.

Fruits.—They are an important part of a child's diet, and should be given in some form every day. Oranges, baked apple, and stewed prunes are the most to be depended upon. Raw apples in most cases should not be given. Peaches, pears, and grapes (with seeds removed) may be given when thoroughly ripe and fresh, but only in moderate quantity. Special care should be exercised in the use of fruits in very hot weather, and in cities where they may not always be fresh. Berries and cherries are best deferred until children are five or six years old, and even then should be given very sparingly.

ARTICLES FORBIDDEN.

The following articles of food are improper for a healthy child under four years of age in all circumstances. Nearly all of them should be prohibited in the case of children under seven years:

Meats.—Ham, sausage, pork in all forms, salt fish, corned beef, dried beef, goose, duck, game, kidney,

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liver and bacon, meat stews, and dressings from roasted meats.

Vegetables.—Potatoes except when boiled or roasted, cabbage, raw or fried onions, raw celery, radishes, cucumbers, tomatoes (raw or cooked), beets, egg-plant, and green corn.

Bread and Cake.—All hot bread, biscuits, or rolls; buckwheat and all other griddle cakes; all sweet cakes, particularly those containing dried fruits and those heavily frosted.

Desserts.—All nuts, candies, dried fruits; all canned or preserved fruits; pies, tarts, and pastry of every description.

Drinks.—Tea, coffee, cocoa, wine, beer, and cider.

Fruits.—Bananas; all fruits out of season; all stale fruits, particularly in cities and during the summer. Grapes are objectionable only on account of the seeds. With most of the other fruits it is the excess in quantity which makes them injurious.

GENERAL RULES TO BE OBSERVED IN FEEDING.

Whether the child feeds himself or is fed by the nurse, the following rules should be observed:

1. Plenty of time should be taken. On no account should the child bolt his food.

2. The child must be taught to chew his food. Yet no matter how much pains are taken in this respect,

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mastication is very imperfectly done by all children; hence up to the seventh year at least, all meats should be very finely cut, all vegetables mashed to a pulp, and all grains cooked very soft.

3. Children should not be continually urged to eat if they are disinclined to do so at their regular hours of feeding, or if the appetite is habitually poor, and under no circumstances should a child be forced to eat.

4. Indigestible food should never be given to tempt the appetite when the ordinary simple food is refused; food should not be allowed between meals when it is refused at mealtime.

5. If an infant refuses its food altogether, or takes less than usual, the food should be examined to see if this is right. Then the mouth should be inspected to see if it is sore. If neither of these things is the cause, the food should be taken away and not offered again until the next feeding time comes.

6. In any acute illness the amount of food should be much reduced and the food made more dilute than usual. If there is fever, no solid food should be given. If the child is already upon a milk diet, this should be diluted, and in some cases partially peptonized.

7. In very hot weather the same rules hold, to give less food, particularly less solid food, and more water.

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FOOD FORMULAS.

Beef Juice.—One pound of rare round steak, cut thick, slightly broiled, and the juice pressed out by a lemon-squeezer, or, better, a meat-press. From two to four ounces of juice can generally be obtained. This, seasoned with salt, may be given cold, or warmed by placing the cup which holds it in warm water. It should not be heated sufficiently to coagulate the albumin which is in solution, and which appears afterward as flakes of meat floating in the fluid.

Beef Juice by the Cold Process.—One pound of finely chopped round steak, six ounces of cold water, pinch of salt; place in covered jar and stand on ice or in a cold place, five or six hours or over night. It is well to shake occasionally. This is now strained and all the juice squeezed out by placing the meat in coarse muslin and twisting it very hard. It is then seasoned and fed like the above.

Beef juice so made is not quite as palatable as that prepared from broiled steak, but it is even more nutritious, and is more economical, as fully twice as much juice can be obtained from a given quantity of meat. Beef juice prepared in either of these ways is greatly to be preferred to the beef extracts sold.

Mutton Broth.—One pound of finely chopped lean mutton, including some of the bone, one pint cold water, pinch of salt. Cook for three hours over a

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slow fire down to half a pint, adding water if necessary; strain through muslin, and when cold carefully remove the fat, adding more salt if required. It may be fed warm, or cold in the form of a jelly.

A very nutritious and delicious broth is made by thickening this with cornstarch or arrowroot, cooking for ten minutes and then adding three ounces of milk or one ounce and a half thin cream to a half pint of broth.

Chicken, Veal, and Beef Broths.—These are made and used in precisely the same manner as mutton broth.

Meat Pulp.—A rare piece of round or sirloin steak, the outer part having been cut away, is scraped or shredded with a knife; one teaspoonful to one tablespoonful may be given, well salted, to a child of eighteen months. Scraping is much better than cutting the meat fine.

For this on a large scale, as in institutions, a Hamburg-steak cutter may be employed.

Junket, or Curds and Whey.—Half a pint of fresh cow's milk, warmed; pinch of salt; a teaspoonful of granulated sugar; add one teaspoonful Fairchild's essence of pepsin, or liquid rennet; stir for a moment, and then allow it to stand at the temperature of the room for twenty minutes, or until firmly coagulated; place in the ice box until thoroughly cold. For

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older children this may be seasoned with grated nutmeg.

Whey.—The coagulated milk prepared as above is broken up with a fork and the whey strained off through muslin. It is best given cold. If some stimulant is desired, sherry wine in the proportion of one part to twelve, or brandy one part to twenty-four, may be added. Whey is useful in many cases of acute indigestion, and will often be retained when everything else is vomited.

Barley Jelly from the Grains.—Three tablespoonfuls of pearl barley; soak overnight, then place this in one quart of fresh water; add pinch of salt, and cook in double boiler steadily for four hours down to one pint, adding water from time to time; strain through muslin. When cold this makes a rather thick jelly. If a thinner gruel (barley water) is desired, a third or half the quantity of barley should be used.

Oat, Wheat, or Rice Jelly.—These are prepared from oatmeal, wheaten grits, and rice grains in the same manner as the barley jelly.

Barley Jelly from the Flour.—Either Robinson's patent barley or prepared barley flour of the Health Food Company may be used. One good tablespoonful of the flour, thoroughly blended with a little cold water, is added to one pint of boiling water containing a pinch of salt; cook for ten minutes, stirring, and

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strain. This makes a jelly of about the consistency of that made from the grains as above. It is essentially the same in composition, and much less trouble to prepare. A thinner gruel (barley water) is made by using half the quantity of flour.

When this is to be mixed with milk, it is well to add the milk to the barley gruel before removing from the fire, and stir two or three minutes, or until the milk has nearly reached the boiling point, when it should be removed and bottled or fed.

Oat or Wheat Jelly from the Flour.—These are made from the prepared oat flour of the Health Food Company or Hubbell's prepared wheat flour. They are used like the barley.

Imperial Granum.—This is prepared and used in precisely the same way as the barley flour above mentioned, the gruel being mixed with milk before it is removed from the fire.

Albumin Water.—The white of one fresh egg; half a pint of cold water; pinch of salt; teaspoonful of brandy. This should be shaken thoroughly and fed cold either with a spoon or from a bottle. It is useful in cases of vomiting, and can sometimes be retained by a very irritable stomach.

Limewater.—One heaping teaspoonful of slaked lime; one quart boiled or distilled water; place in a corked bottle and shake thoroughly two or three times

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during the first hour. The lime should then be allowed to settle, and after twenty-four hours the upper clear fluid carefully poured or siphoned off for use.

Dried Bread.—Either stale or fresh bread may be used; it is cut in thin slices and placed in the oven, with the door open, and quickly dried until it is crisp, but not browned. It is in many respects preferable to crackers for little children.

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III.

MISCELLANEOUS.

THE BOWELS.

How many movements daily should an infant have during the first few weeks of life?

Usually three or four a day for the first week, and then two or three each day.

How many after a child is a month old?

Usually two each day, but often only one.

What is the appearance of a healthy movement of a child who is taking nothing but milk?

It is soft, yellow, and smooth, containing no lumps.

When are the stools dark brown or black?

While taking bismuth, iron, and sometimes when taking much meat or beef juice. They may be dark brown or black from blood. This last is a condition which may indicate serious illness.

How may a child be trained to be regular in its bowels?

By endeavoring to have them move at exactly the same time every day.

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At what age may an infant be trained in this way?

Usually by the second month if training is begun early.

What is the best method of training?

A small chamber, about the size of a pint bowl, is placed between the nurse's knees, and upon this the infant is held, its back being against the nurse's chest and its body firmly supported. This should be done twice a day, after the morning and afternoon feedings, and always at the same hour. At first there may be necessary some local irritation, like that produced by tickling the anus or introducing just inside the rectum a small cone of oiled paper or a piece of soap, as a suggestion of the purpose for which the baby is placed upon the chamber; but in a surprisingly short time the position is all that is required. With most infants, after a few weeks the bowels will move as soon as the infant is placed on the chamber.

What advantage has such training?

It forms the habit of having the bowels move regularly at the same hour, which is a matter of great importance in infancy and makes regularity in childhood much easier.

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SLEEP.

Should a child sleep in the same bed with its mother or nurse?

Under no circumstances, if this can possibly be avoided. Very young infants have often been smothered by their mothers, by overlying during sleep. If the infant sleeps with the mother, there is always the temptation to frequent nursing at night, which is injurious to both mother and child. Older children also should, if possible, have separate beds; many contagious diseases and bad habits are contracted by children sleeping together.

How should an infant's bed be prepared?

The mattress should be firm but soft, the pillow very thin, and the covering not excessive. A baby should not be allowed to sleep always in the same position, but should be changed from side to side. Hair pillows are useful in summer and for children who perspire very much.

How much sleep is natural for a newly-born baby?

Most infants will sleep at this period about nine tenths of the time.

How much should a baby sleep at six months?

About two thirds of the time.

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Up to what age should an older child take a nap during the day?

Always until four years old, and if possible longer.

At what age may an infant go all night without feeding?

At five months a child should not be fed or nursed between 10 P. M. and 7 A. M. At two years a child can easily go from 6 P. M. to 7 A. M. without feeding.

How should a baby be put to sleep?

The room should be darkened and quiet, the child's hunger satisfied, and the child made generally comfortable and laid in its crib while awake.

Is rocking necessary?

By no means. It is a habit easily acquired, but hard to break, and a very useless and sometimes injurious one. The same may be said of sucking a rubber nipple and all other devices for putting children to sleep.

What are the principal causes of disturbed sleep?

The most frequent one is indigestion from overfeeding; often it is feeding too frequently at night. A child who is fed three or four times at night is invariably a bad sleeper.

What are some other causes?

In nervous children it may come from excitement, like romping and playing just before bedtime. Bad

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sleep is also one of the earliest and most frequent signs of illness. In older children sleep may be disturbed by fear excited by the stories told just before bedtime.

When are children likely to sleep too much?

Too much sleep is rare, excepting from serious illness, or from the use of soothing syrups or other drugs. These should never, under any circumstances, be given.

EXERCISE.

Is exercise important for infants?

It is as necessary for them as for older children.

How is it obtained?

A young baby gets its exercise by screaming, waving its arms, kicking, etc. The clothing should not be so tight as to make these movements impossible. At least twice a day it should be allowed for fifteen or twenty minutes the free use of its limbs, by permitting it to lie upon a bed in a warm room, with all clothing except the shirt, stockings, and napkin removed. Later, when in short clothes, the baby may be put upon a thick blanket or quilt laid upon the floor, and be allowed to tumble about at will. A nursery fence two feet high, made to surround a mattress, is an excellent device and makes a convenient box stall for the young animal, where it can learn to

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use both its arms and legs without the danger of injury. Only by exercise such as this do the muscles have an opportunity to develop properly.

CRY.

When is crying useful?

In the newly-born infant the cry expands the lungs, and it is necessary that it should be repeated for a few minutes every day in order to keep them well expanded.

How much crying is normal for a very young baby?

From fifteen to thirty minutes a day is not too much.

What is the nature of this cry?

It is loud and strong. Infants get red in the face with it; in fact, it is a scream. This is necessary for health. It is the baby's exercise.

When is a cry abnormal?

When it is too long or too frequent. The abnormal cry is rarely strong, but it is a moaning or a worrying cry, sometimes only a feeble whine.

What are the causes of such crying?

Pain, temper, hunger, illness, and habit.

What is the cry of pain?

It is usually strong and sharp, but not generally continuous. It is accompanied by contraction of the

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features, drawing up of the legs, and other symptoms of distress.

What is the cry of hunger?

It is usually a continuous, fretful cry, rarely strong and lusty.

What is the cry of temper?

It is loud and strong and accompanied by kicking or stiffening of the body, and is usually violent.

What is the cry of illness?

This is usually more of fretfulness and worrying than a real cry, although crying is excited by very slight causes.

What is the cry of indulgence or from habit?

This is often heard even in very young infants, who cry to be rocked, to be carried about, sometimes for a light in the room, for a bottle to suck, or for the continuance of any other bad habit which has been acquired.

How can we be sure that a child is crying to be indulged?

If it stops immediately when it gets what it wants, and cries when it is withdrawn or withheld.

What should be done if a baby cries at night?

One should get up and see that the child is comfortable,—the clothing smooth under the body, the hands and feet warm, and the napkin not wet or

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soiled. If all these matters are properly adjusted and the child simply crying to be taken up, it should not be further interfered with.

How is an infant to be managed that cries from temper or to be indulged?

It should simply be allowed to cry it out. A second struggle will be shorter and a third rarely necessary.

Is it likely that rupture will be caused from crying?

Not in young infants if the abdominal band is properly applied, and not after a year under any circumstances.

How should a young baby be lifted from its bed?

The right hand should grasp the clothing below the feet, and the left hand should be slipped beneath the infant's body to its head. It is then raised upon the left arm.

What is the advantage of this?

The entire spine is supported, and no undue pressure is made upon the chest or abdomen, as often happens if the baby is grasped around the body or under the arms.

How should a child old enough to run about be lifted?

Always by placing the hands under the child's arms, and never by the wrists.

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What injury may be inflicted by lifting the child by the wrists or hands?

Often serious injury is done to the elbow or shoulder joints.

What is the normal temperature of an infant?

In the rectum it is usually 98·5° or 99° F.; although even in perfect health it may vary from 98° to 99·5° F.

Where should the temperature of infants and young children be taken?

The rectum is altogether the best place, and next to this the groin. The rectal temperature is from half a degree to a degree higher than that in the groin.

How long should the thermometer be left in place to take the temperature?

Three minutes in the rectum, and five minutes in the groin.

Is the temperature of a young child a good guide as to the severity of its symptoms in illness?

As a rule it is. A temperature of 100° to 102° F. commonly means a mild illness, and one of 104° F. or over a serious one. It should, however, be remembered that in all young children slight causes often produce a high temperature which lasts for a few hours; one should not therefore be unduly alarmed

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unless the temperature continues high, or is accompanied by other signs of illness.

Why is it that infants and little children so readily become very nervous, and what can be done to prevent it?

The most important reason is the delicate structure of the brain at this time, and its rapid growth. It grows as much during the first year as during all the rest of life. This requires quiet and peaceful surroundings. Infants who are naturally nervous should be left much alone, should see but few people, should be played with very little, and should never be quieted with soothing syrups or nipples to suck.

At what age may playing with babies be begun?

Never until four months, and better not until six months. The less of it at any time the better for the infant.

What harm is done by playing with very young babies?

They are made nervous and irritable, sleep badly, and suffer in other respects.

When may babies be played with?

If at all, in the morning, or after the midday nap. Never just before bedtime.

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Are there any valid objections to kissing infants?

There are many serious objections. Tuberculosis, diphtheria, and many other grave diseases may be communicated in this way. The kissing of infants upon the mouth by other children, by nurses, or by people generally, should under no circumstances be permitted. Infants should be kissed, if at all, upon the cheek or forehead, but the less even of this the better.

NURSERY MEDICINE.

What should be done for a child in convulsions before a doctor arrives?

Keep the child perfectly quiet with ice at the head, put the feet in a mustard bath, and roll the entire body in large towels which have been dipped in mustard water (two heaping tablespoonfuls of mustard to one quart of tepid water), and have plenty of hot water and a bath tub at hand, so that the doctor can give a hot bath if he thinks it advisable.

What should be done for a child with bleeding from the nose?

The child should sit upright, the nose should be compressed tightly with the fingers, and iced cloths applied to it. The child should not blow his nose for some time afterward.

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What should be done if a foreign body has been swallowed?

First, examine the throat with the finger to see if it has lodged there, and if so remove it. If it has passed from the throat it has usually gone into the stomach.

What should be done in this case?

Give the child plenty of dry food, like bread, potato, etc., but under no circumstances either an emetic or cathartic. An infant may have its usual food.

What harm would a cathartic do?

It is likely to hurry the foreign body too rapidly through the bowels and in this way do harm; otherwise it becomes coated with fæcal matter and passes the intestine usually without doing injury.

What should be done if a child gets a foreign body into the ear?

Unless this can easily be removed with the fingers it should not be meddled with, for it is likely to be pushed farther into the ear. The child should be taken to a physician.

What should be done if there is a foreign body in the nose?

The child should blow his nose strongly while the empty nostril is compressed. Unless this removes it

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a physician should be called. Meddlesome interference is always harmful.

What are the symptoms of colic?

There is a strong, hard cry, which comes suddenly and returns every few minutes. With this there is drawing up of the feet, contraction of the muscles of the face, and other signs of pain. The abdomen is usually tense and hard.

What should be done for a baby with colic?

First, see that the feet are warm. Place them against a hot-water bag, or hold them before an open fire; apply a hot flannel to the abdomen, or let the child lie upon its stomach across a hot-water bag. If the colic continues, a half teacupful of warm water containing ten drops of turpentine may be injected into the bowels with a syringe; at the same time the abdomen should be gently rubbed so as to start the wind. If the gas is in the stomach, half of a soda mint tablet may be given in a tablespoonful of very warm water.

What are the symptoms of earache?

The pain is generally severe and accompanied by a sharp scream; the child often puts the hand to the affected ear, or cries whenever it is touched. The pain is likely to be prolonged and continuous.

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How should a child with earache be treated?

Twenty drops of warm water should be put into the ear, and a poultice of flaxseed applied warm, but not too hot, or the hot-water bag may be held against the ear. A good device is to fill the little finger of a kid glove with hot salt, and insert this in the ear before the heat is applied upon the outside.

CROUP.

What are the symptoms of croup?

There is a hollow, dry, barking cough, with some difficulty in breathing.

When is this likely to come on?

Usually at night.

Is simple croup dangerous?

The ordinary croup of infants is spasmodic croup, and is very rarely dangerous, although the symptoms seem very alarming.

What are the symptoms?

In a mild attack there is simply noisy breathing, especially on drawing in the breath, with a tight, barking, or croupy cough. In a severe attack the child's breathing is more noisy and becomes difficult.

What is the dangerous form of croup?

Membranous croup, which is the same thing as diphtheria of the larynx.

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How does this develop?

Gradually; very rarely does it come on suddenly.

What should be done for a baby who has spasmodic croup?

The room should be very warm, hot cloths or poultices should be applied over the throat, and either a croup kettle or an ordinary tea-kettle kept boiling in the room. This is more efficacious if the child is placed in a tent made by a raised umbrella with a sheet thrown over it, and the steam introduced beneath the tent. If the symptoms are urgent, ten drops of the syrup of ipecac should be given every fifteen minutes until free vomiting occurs. Whenever the symptoms reach a point where breathing becomes difficult, a doctor should be summoned without delay.

CONTAGIOUS DISEASES.

How does measles begin?

Gradually, like an ordinary cold in the head, with cough, sneezing, running eyes and nose. The eruption usually appears on the fourth day, first on the face and neck.

How does scarlet fever begin?

Generally it comes suddenly, with vomiting, high fever, and sore throat. The eruption appears upon the second day, first upon the neck and chest.

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How does whooping-cough begin?

For a week or ten days it can not be distinguished from an ordinary cold on the chest. Then the attacks of coughing gradually become harder and last longer, the child gets very red in the face and sometimes vomits its food. After a severe coughing fit it catches its breath with a peculiar noise known as the whoop.

How does diphtheria begin?

Sometimes suddenly, but usually very gradually, with sore throat and often swelling of the glands of the neck, with white patches upon the tonsils, or a very free discharge from the nostrils.

How long after exposure do the first symptoms appear in the different diseases?

In scarlet fever in from two to five days; in measles in from nine to fourteen days; in whooping-cough in from one to two weeks. In diphtheria it varies much; it may be only one day, and it may be two or three weeks.

Which of these diseases are most contagious?

Measles is so very contagious that very few children who have not had it can come near a person suffering from the disease without taking it. Whooping-cough is almost as contagious as measles, and for young babies even more so. A very close exposure

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is not necessary in the case of either of these diseases, and whooping-cough can undoubtedly be contracted in the open air. Scarlet fever and diphtheria are much less contagious; for both of these a pretty close exposure is necessary, and even then many who are exposed escape.

At what period are these diseases contagious?

From the very beginning of the symptoms. Measles and scarlet fever are quite as likely to be communicated in the early stages as when the eruption is fully out.

How long should a child with any of these diseases be kept away from other children?

In measles, two weeks after the rash has gone; in scarlet fever, at least four weeks after the rash has gone, and longer if the peeling is not over or if the ears are running; in whooping cough, for two months, or so long as the paroxysmal cough continues; in diphtheria at least ten days after the throat is well in a very mild case, and four weeks if the case has been severe.

What should be done when a child shows the first symptoms of serious illness?

The child should be put to bed. If it is an infant, the food should be diluted to one half the usual strength; if an older child, only fluid food should

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be given. If the child seems feverish, take the temperature. If the bowels are constipated, give a teaspoonful of castor oil, but no other medicine without the doctor's orders. Send for the doctor at once, and until he comes carefully exclude all other children from the room.

By what nursery training may the examination and treatment of sick children be made much easier?

By teaching all children to gargle, to show the throat, to take pills, and by constantly teaching them to regard the doctor as the child's best friend, and his visits as a great treat. On no account should a child be frightened into obedience by threats of what the doctor will do.

With care and patience most children may be taught to gargle and take pills at four or five years, and to show the throat willingly at two or three. All these matters should be made a part of the child's education.

CONSTIPATION.

When it is necessary to move the bowels immediately, what are some of the easiest methods?

An injection of one tablespoonful of sweet oil may be given, or half a teaspoonful of glycerin in one tablespoonful of water, or a teacupful of tepid soap and water, or a glycerin suppository. None of these should be continued excepting under the physician's directions.

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What sort of a syringe is to be preferred for giving an injection to an infant?

The bulb syringe is the simplest; this consists of an oval bulb of soft rubber and a soft rubber or a hard rubber tip. It holds one or two ounces.

What is the most essential thing in preventing or overcoming constipation?

The formation of the habit of having the bowels move every day regularly at the same hour, and proper early training (see page 83).

What is the best hour?

In most cases immediately after the first meal in the morning.

What are some simple means by which constipation may be relieved?

The best are diet, suppositories, and massage.

The changes to be made in the milk of constipated infants have been mentioned on page 49. The addition to the milk of some of the malted foods, such as Mellin's food or malted milk, is sometimes useful. For little children the fruit juices are particularly beneficial when given half an hour or more before the first morning feeding, with half a glass of water.

For older children the amount of white bread, toast and potato, should be reduced, and green vegetables, oatmeal, and Graham bread given, with plenty

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of fruit twice a day. Raw scraped apples are sometimes of more value than any other fruit.

The best suppositories for continuous use are probably the gluten suppositories of the Health Food Company. One should be given the first thing in the morning. They act rather slowly, usually in about two hours. In obstinate cases one may also be used at bedtime. Glycerin suppositories act more quickly, but are too irritating for regular use.

Massage consists in rubbing the abdomen, which may be done in one of two ways: Beginning at the right groin, the hand is carried up to the ribs, then across to the opposite side, then around to the left groin. The abdomen is stroked gently at first, and afterward deeper pressure used as the child becomes accustomed to it. The second method is by rubbing the deeper parts with a circular movement—the fingers not moving upon the skin—making a series of small circles, beginning at the right groin and following the same course as described above. Either method should be employed for six or eight minutes twice a day, at almost any regular time, except soon after a meal.

DIARRHŒA.

In case a child is suddenly taken with diarrhœa, what should be done?

All solid food should be stopped at once. If the food is milk, it should be greatly diluted; and if

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there is also vomiting, milk should be stopped altogether, and only broth or boiled water given for at least twelve hours. Some cathartic, such as castor oil, is usually needed. The child should be kept perfectly quiet.

Why is a cathartic necessary if the movements are already frequent?

Such movements are nearly always due to an irritation in the bowel, set up by food which has not been digested. The diarrhœa is Nature's effort to get rid of the irritant. Nothing to stop the movements should be given until the bowels have been thoroughly cleared by the treatment mentioned.

BAD HABITS.

What are the most common bad habits of children?

Sucking, nail-biting, bed-wetting, and masturbation.

What do children suck?

Most frequently the thumbs, sometimes the fingers, the hand, the clothing, or the blanket, often a rubber nipple or a sugar rag.

When is this habit usually seen?

It begins in quite early infancy, and if not broken up may last until children are six or seven years old.

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At what age is the nail-biting seen?

Usually in children from two to five years old.

At what age may an infant generally be expected to go without wetting during the night?

Usually at two and a half years, if it is taken up late in the evening.

What is masturbation?

It is the habit of rubbing the genital organs with the hands, with the clothing, against the bed, or rubbing the thighs together. It may be seen in children as young as a year old.

What should be done when one of these habits is discovered?

The fact should be brought immediately to the notice of the mother and physician, and every means taken to break up the habit while the child is young, and before it becomes deeply seated.

In the case of sucking or nail-biting, confining the hands to the sides during sleep or the wearing of mittens will often succeed if persisted in. The application of pasteboard splints to the elbows makes it impossible for the child to get his hand to his mouth. On no account should the habit of sucking be allowed as a means of putting children to sleep or of quieting them while restless or suffering from indigestion.

Bed-wetting is more of a disease than a habit, and

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the child should never be whipped for it; it should receive medical treatment.

Masturbation is the most injurious of all these habits, and should be broken up just as early as possible. Children should especially be watched at the time of going to sleep and on first waking. Punishments are of little avail, and usually make matters worse. Medical advice should at once be sought.

THE END.

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